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EXAMINER	
HE, JIALONG	

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/826,469	REZNIK, YURIY A.	
	Examiner	Art Unit	
	JIALONG HE	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 August 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on 08/18/2008 has been entered. Claims 1, 9, 11, 19, and 29 have been amended. No claim has been added or canceled. Claims 1-31 are still pending in this application, with claims 1, 19, 26, and 29 being independent.

Response to Arguments

2. Applicant's arguments have been fully considered but they are not persuasive for the following reasons.

Regarding claim 1, applicant argues (**remarks, page 10**) that Robinson does not disclose what is claimed in **amended Claim 1**, namely that determining a distribution of **a subblock of residual data** comprises a step of explicitly "*determining a plurality of statistical measures, including at least one of a skewness of the distribution, and a kurtosis of the distribution*". The examiner respectively disagrees with this argument. First, there is no limitation "**a subblock of residual data**" in the amended claim 1. Second, the claim 1 is amended and currently rejected under 103. It is improper by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The applicant further argues (**remarks, page 11**) "*Thus, Robinson discloses merely a basic lossless audio encoder that does not utilize as part of the residual encoding process the novel step of "determining a plurality of statistical measures, including at least one of a skewness of the distribution, and a kurtosis of the distribution," as amended in Claim 1. Indeed, Robinson discloses absolutely nothing about a need or utility of determining any of the enumerated statistical measures. The Office Action appears to admit as much, stating that Robinson's Gaussian function "inherently has mean and variance values*". The examiner respectively disagrees with this argument. Robinson explicitly states "*in the first mode, the variance of the prediction residual of the original waveform is estimated*" (**Robinson, page 8, in the middle**). Nadon discloses estimating skewness and kurtosis **(Nadon, [0057])**. The combined teaching teaches the limitation "determining a plurality of statistical measures, including at least one of a skewness of the distribution, and a kurtosis of the distribution," as amended in Claim 1.

Applicant further argues (**remarks, page 12**) "*One of ordinary skill in the art would have had no motivation to combine Robinson with Nadon*". The examiner respectively disagrees with this argument. Both Robinson and Nadon are estimating statistics measurements of a distribution of data regardless these data are obtained from speech signals or genomic samples. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation

to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). Nadon specifically discloses all the statistics measurements used are well known (**Nadon, [0057], skewness and kurtosis measures are standard statistical indices, see Stuart & Ord "Distribution theory,", New York, Halsted Press, 1994**). Robinson teaches modeling the prediction residual with a Gaussian function which is only characterized by mean and variance. For a complex data distribution, people with ordinal skilled in the art are motivated to use other known statistic measurements including skewness and/or kurtosis to model the distribution of residual data more accurately as Nadon did for genomic data.

Applicant further argues (remarks, page 13) "**Combining Robinson with Nadon requires impermissible hindsight reasoning**". In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See In re McLaughlin, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). As disclosed by Nadon that skewness and kurtosis measures are standard statistical measurements (**Nadon, [0057]**). Nadon also

demonstrated that skewness and kurtosis measurement provides more accurate measures for modeling a distribution of data (**Nadon, Abstract**).

Drawings

3. Figure 1 was received on 08/18/2008. The objection to the drawing has been withdrawn.

Claim Objections

4. Claims 19, 26, and 29 are objected to because of the following informalities:

Claims 19, 26, and 29 recites "**at least at least**" which appears to be a misspelling of the term "**at least**".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-4, 7-15, and 19-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson ("Shorten: simple lossless and near-lossless waveform

compression”, 1994, hereinafter referred to as Robinson) in view of Nadon et al. (US PGPub. 2002/0094535, hereinafter referred to as Nadon).

Regarding claim 1, Robinson discloses a method comprising:

applying a prediction filter to a unit of audio signal data (**page 2, section 3**);

determining a distribution substantially representative of residual data generated as part of said applying of a prediction filter to the unit of audio signal data (**page 4, section 3.3, figure 2 and 3**); and

transmitting in substance the unit of audio signal data to a recipient (**page 11, shorten command line, the compressed data can be saved to a file or piped out to another program**), utilizing the determined distribution to assist in reducing the amount of data having to be transmitted (**page 4, section 3.3, residual coding**).

Robinson discloses modeling the predictive residual with a Gaussian or Laplace function (**fig. 2**). He does not discloses determining of the statistical distribution comprises determining a plurality of statistical measures, including at least one of a skewness of the distribution, and a kurtosis of the distribution.

Nadon discloses measuring skewness and kurtosis of a distribution. Nadon also pointed out that skewness and kurtosis are standard statistical measurements of a distribution and are described in a statistical book (**Nadon, [0057]**).

Both Robinson and Nadon are measuring the distribution of data. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Robinson's teachings with Nadon's teaching to include skewness and kurtosis measurements of the residual distribution to improve reliability and accuracy (**Nadon, Abstract**).

Regarding claim 2, which depends on claim 1, Robinson in view of Nadon discloses all limitations of claim 1, Robinson further discloses receiving a portion of a stream of audio signal data (**page 2, signal s(t)**); and partitioning the stream of the audio signal data into a plurality of units of audio data (**page 3, section 3.1, blocking and time frame**).

Regarding claim 3, which depends on claim 2, Robinson in view of Nadon discloses all limitations of claim 2, Robinson further discloses the partitioning comprises partitioning the stream of the audio signal data into a plurality of fixed-size units of audio signal data (**page 3, section 3.1, the default frame size is 256 samples**).

Regarding claim 4, which depends on claim 2, Robinson in view of Nadon discloses all limitations of claim 2, Robinson also discloses the method further comprises:

selecting one of the plurality of units of audio signal data partitioned from the portion of the stream of audio signal data; performing said applying, determining and

transmitting operations of claim 1 for the selected unit of audio signal data; and repeating the selecting and performing until all units of the partitioned audio signal data have been transmitted in substance to the recipient (**page 1-10, the utility program "shorten" compresses a signal on frame-by-frame base until all frames are processed and saves the compressed signal in a file**).

Regarding claim 7, which depends on claim 1, Robinson in view of Nadon discloses all limitations of claim 1, Robinson further discloses transmitting a plurality of parameters of the prediction filter to the recipient (**page 3, section 3.2, prediction coefficients a_i, page 11, transmitting each filter coefficient requires about 7 bits)**.

Regarding claim 8, which depends on claim 7, Robinson in view of Nadon discloses all limitations of claim 7, Robinson further discloses the applying comprises applying a linear prediction filter having a prediction order p, and prediction coefficients $a_1, \ldots, a_p$; and the transmitting of the parameters of the prediction filter comprises transmitting the prediction order p, information about quantization step size used to quantize prediction coefficients, and quantized versions of the prediction coefficients $a_1, \ldots, a_p$ (**page 2, eq. 1, page 11, "shorten" command line option "-p prediction order", page 7, section 3.2, the prediction coefficients, a_i, are quantized**).

Regarding claim 9, which depends on claim 1, Robinson in view of Nadon discloses all limitations of claim 1, Robinson further discloses the residual data

comprises a plurality of residual samples (**page 4, section 3.3, samples in prediction residual**); the determining of the statistical measure further comprises determining a variance of the residual samples or an estimate of the variance (**page 8, the variance of the prediction residual of the original waveform is estimated**); forming a residual data distribution descriptor based at least in part on the determined variance of the residual samples or its estimate, the distribution descriptor identifying the substantially representative distribution to the recipient (**section 3.3, the problem of residual coding is therefore to find an appropriate form for the probability density function (PDF), mean and variance of a Gaussian distribution function (**a residual data distribution descriptor**))**; and the transmitting comprises transmitting the residual data distribution descriptor to the recipient (**page 5, Huffman code for this distribution**).

Regarding claim 10, which depends on claim 9, Robinson in view of Nadon discloses all limitations of claim 9, Robinson further discloses the determining of the statistical measures further comprises determining a mean of the residual samples; and the forming of the residual data distribution descriptor is further based on the determined mean of the residual samples (**figure 2, residual signal is modeled by Gaussian or Laplacian distribution function, both are characterized by mean and variance**).

Regarding claim 11, which depends on claim 9, Robinson in view of Nadon discloses all limitations of claim 9, Robinson discloses forming the residual data

distribution descriptor including variance (**page 8, the variance of the prediction residual of the original waveform is estimated**). Nadon discloses measuring skewness and the kurtosis of the distribution (**Nadon, [0057]**). The combined teachings of teaches the forming of the residual data distribution descriptor is further based on the determined at least selected one of the skewness and the kurtosis of the residual samples.

Regarding claim 12, which depends on claim 1, Robinson in view of Nadon discloses all limitations of claim 1, Robinson further discloses the residual data comprises a plurality of residual samples (**page 4, section 3.3, samples in prediction residual**); the method further comprises determining a number of least significant bits (LSB) of each residual sample to be sent to the recipient (**page 5, the *n* low order bits (**least significant bits**) then follow, as in the example in table 1**); and the transmitting comprises transmitting to the recipient how many LSB of each residual sample will be transmitted to the recipient and the appropriate number of LSB of each of the residual samples (**page 5, table 1**).

Regarding claim 13, which depends on claim 12, Robinson in view of Nadon discloses all limitations of claim 12, Robinson further discloses the method further comprises determining a reconstructed inverse-quantized mean value of the residual samples, and the determining of the LSB of each residual sample to be sent to the recipient is performed based at least in part on the determined reconstructed inverse-

quantized mean value of the residual samples (**page 3, section 3.2, on each iteration the mean squared value of the prediction residual is calculated and this is used to computer the expected number of bits needed to code the residual signal**).

Regarding claim 14, which depends on claim 1, Robinson in view of Nadon discloses all limitations of claim 1, Robinson further discloses the residual data comprises a plurality of residual samples, each having a plurality of data bits (**page 4, section 3.3, samples in prediction residual, page 5, table 1, residual samples have a plurality of data bits**); the method further comprises encoding the most significant bits (MSB) of each of the residual samples, employing codes constructed using the determined substantially representative distribution (**page 5, Huffman code for this distribution**); and the transmitting comprises transmitting the encoded MSB of the residual samples to the recipient (**page 5, the high order bits (**most significant bits**) are treated as an integers**).

Regarding claim 15, which depends on claim 14, Robinson in view of Nadon discloses all limitations of claim 14, Robinson further constructing the codes using the distribution, the constructed codes being Huffman codes (**page 5, Huffman code for this distribution**).

Regarding 19, Robinson discloses an apparatus (**page 9, Shorten running on SGI workstation**) comprising

a prediction filter (**page 2, equation 1**);

a transmission unit (**page 11, shorten command line, the compressed signal is saved to a file or sent to a program**); and

a control unit (**page 9, CPU in SGI workstation**) coupled to the prediction filter and the transmission unit, and adapted to apply the prediction filter and a plurality of statistical measures of the distribution to a unit of audio signal data to a recipient, and to use the transmission unit to transmit in substance the unit of audio signal data to the recipient, utilizing a distribution substantially representative of the residual data generated by the prediction filter to assist in reducing the amount of data having to be transmitted by the transmission unit (**page 4, section 3.3 residual coding**).

Robinson does not disclose wherein the statistical measures include at least one of a skewness of the distribution, and a kurtosis of the distribution.

Nadon discloses measuring skewness and kurtosis of a distribution. Nadon also pointed out that skewness and kurtosis are standard statistical measurements of a distribution and are described in a statistical book (**Nadon, [0057]**).

Both Robinson and Nadon are measuring the distribution of data. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Robinson's teachings with Nadon’s teaching to include

skewness and kurtosis measurements of the residual distribution to improve reliability and accuracy (**Nadon, Abstract**).

Regarding 20, which depends on claim 19, Robinson in view of Nadon discloses all limitations of claim 19, Robinson further discloses the control unit is adapted to use the transmission unit to transmit a plurality of parameters of the prediction filter to the recipient (**page 3, section 3.2, linear prediction, prediction coefficients, a_i, are quantized**).

Regarding 21, which depends on claim 19, Robinson in view of Nadon discloses all limitations of claim 19, Robinson further discloses the control unit is adapted to use the transmission unit to transmit a residual data distribution descriptor, formed using at least some of the statistical measures of the residual data, to the recipient, the distribution descriptor identifying the substantially representative distribution, and the statistical measures are employed to identify the substantially representative distribution (**figure 2 and 3, residuals are modeled by a Gaussian or Laplacian distribution function, section 3.3, Huffman code for this distribution**).

Regarding 22, which depends on claim 19, Robinson in view of Nadon discloses all limitations of claim 19, Robinson further discloses the apparatus further comprises a computation unit coupled to the prediction filter and the control unit, and adapted to compute at least a plurality of statistical measures for the residual data generated by the

prediction filter (**section 3.3, a computer with CPU estimates and models the distribution of a residual signal with a Gaussian function. The Gaussian function has a plurality of statistical measures, mean and variance**).

Regarding 23, which depends on claim 19, Robinson in view of Nadon discloses all limitations of claim 19, Robinson further discloses the residual data comprises a plurality of residual samples having data bits (**section 3.3, the samples of residual, a number is divided into a sign bit, the nth low order bits and the remaining high order bits**), and the control unit is adapted to use the transmission unit to transmit a plurality of the least significant bits (LSB) of each of the residual sample (**table 1, lower bits (**least significant bits**)**), to the recipient, the LSB of each of the residual sample transmitted being determined based at least in part on the determined substantially representative distribution (**page 5, Huffman code for this distribution**).

Regarding 24, which depends on claim 19, Robinson in view of Nadon discloses all limitations of claim 19, Robinson further discloses the residual data comprises a plurality of residual samples having data bits (**section 3.3, the samples of residual, a number is divided into a sign bit, the nth low order bits and the remaining high order bits**), and the control unit is adapted to use the transmission unit to transmit a plurality of codes, encoding the most significant bits (MSB) of each of the residual sample (**page 5, the high order bits (**most significant bits**) are treated as an integer**), to the recipient, the codes being constructed based at least in part on the determined

substantially representative distribution of the residual samples (**page 5, Huffman code for this distribution**).

Regarding 25, which depends on claim 24, Robinson in view of Nadon discloses all limitations of claim 24, Robinson further discloses an encoder adapted to encode the MSB of each of the residual samples, using codes constructed from determined substantially representative distribution of the residual samples (**section 3.3, the problem of residual coding is therefore to find an appropriate form for the probability density function, Huffman code for this distribution, a number is divided into a sign bit, the nth low order bits and the remaining high order bits, the high order bits are treated as an integer**).

Regarding 26, Robinson discloses an apparatus (**page 9, Shorten running on SGI workstation**) comprising

a receiver unit (**computer read from a compressed file**);

a decoder coupled to the receiver unit (**page 14, shorten command line option –x, reconstruct the original file**); and

a control unit coupled to the receiver unit and the decoder, and adapted to use the decoder to recover a unit of audio signal data from an encoded transmission of the unit of audio signal received by the receiver unit (**CPU running on a computer reads compressed data and reconstruct the original file**), the encoded transmission included encoded most significant bits (MSB) and unencoded least significant bits (LSB)

of residual samples of residual data generated by a prediction filter applied to the unit of audio signal data (**section 3.3, residual coding, to form a code, a number is divided into a sign bit, the nth low order bits and the remaining high order bits**).

Robinson discloses a audio signal is lossless encoded based on the residual distribution which is modeled with Laplace function and have variance statistic measure (**Robinson, section 3.3, residual coding, eq. 11**). Robinson does not disclose the statistics measure including at least one of a skewness of the distribution of the residual samples, and a kurtosis of the distribution of the residual samples.

Nadon discloses measuring skewness and kurtosis of a distribution. Nadon also pointed out that skewness and kurtosis are standard statistical measurements of a distribution and are described in a statistical book (**Nadon, [0057]**).

Both Robinson and Nadon are measuring the distribution of data. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Robinson's teachings with Nadon's teaching to include skewness and kurtosis measurements of the residual distribution to improve reliability and accuracy (**Nadon, Abstract**).

Regarding claim 27, which depends on claim 26, Robinson in view of Nadon discloses all limitations of claim 26, Robinson further discloses the control unit is further

adapted to at least contribute in causing a inverse-quantized mean of the residual samples to be reconstructed (**page 3, section 3.2, on each iteration the mean squared value of the prediction residual is calculated and this is used to computer the expected number of bits needed to code the residual signal**).

Regarding claim 28, which depends on claim 26, Robinson in view of Nadon discloses all limitations of claim 26, Robinson further discloses the distribution descriptor identifies the substantially representative distribution of the residual samples (**fig. 2**), and the control unit is further adapted to at least contribute in causing the substantially representative distribution to be available to the decoder for use to decode a plurality of codes received by the receiver unit, the codes encoding the MSB of the residual samples (**section 3.3, residual coding**).

Regarding claim 29, Robinson discloses a system (**page 9, Shorten running on SGI workstation**) comprising:

a prediction filter (**page 2, equation 1**);

a transmission unit (**page 11, a compressed signal is saved to a file or sent to a program**);

a receiver unit (**computer reads from a file or from a program**);

a decoder unit (**page 14, shorten command line option –x, reconstruct the original file**); and

a control unit (**page 9, CPU in SGI workstation**) coupled to the prediction filter and the transmission unit, and adapted to apply the prediction filter to a first unit of audio signal data to a recipient, and to use the transmission unit to transmit in substance the first unit of audio signal data to the recipient, utilizing a distribution substantially representative of the residual data generated by the prediction filter to assist in reducing the amount of data having to be transmitted by the transmission unit, wherein the plurality of statistical measures include at least one of a skewness of the distribution, and a kurtosis of the distribution, the control unit being further coupled to the receiver unit and the decoder unit, and adapted to use the decoder to recover a second unit of audio signal data from an encoded transmission of the second unit of audio signal received by the receiver unit, the encoded transmission included encoded most significant bits (MSB) and unencoded least significant bits (LSB) of residual samples of residual data generated by a prediction filter applied to the second unit of audio signal data (**pages 1-10**).

Robinson discloses a audio signal is lossless encoded based on the residual distribution which is modeled with Laplace function and have variance statistic measure (**Robinson, section 3.3, residual coding, eq. 11**). Robinson does not disclose the statistics measure including at least one of a skewness of the distribution of the residual samples, and a kurtosis of the distribution of the residual samples.

Nadon discloses measuring skewness and kurtosis of a distribution. Nadon also pointed out that skewness and kurtosis are standard statistical measurements of a distribution and are described in a statistical book (**Nadon, [0057]**).

Both Robinson and Nadon are measuring the distribution of data. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Robinson's teachings with Nadon's teaching to include skewness and kurtosis measurements of the residual distribution to improve reliability and accuracy (**Nadon, Abstract**).

Regarding claim 30, which depends on claim 29, Robinson in view of Nadon discloses all limitations of claim 29, Robinson further discloses a transceiver unit comprising the transmitter and receiver units (**a computer (SGI workstation) has input and output function**).

Regarding claim 31, which depends on claim 29, Robinson in view of Nadon discloses all limitations of claim 29, Robinson further discloses an encoder unit coupled to the prediction filter and the transmission unit, to encode the MSB of the first unit of audio signal data, the MSB of the first unit of audio signal data being determined based at least in part on statistical measures of the residual samples generated by the prediction filter, when applied to the first unit of audio signal data (**section 3.3, residual coding**).

7. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson in view Nadon and further in view of Hasegawa-Johnson et al. ("Speech coding: fundamentals and applications", December 2002, hereinafter referred to as Johnson).

Regarding claim 5, which depends on claim 2, Robinson in view of Nadon discloses all limitations of claim 2. Robinson in view of Nadon does not say further partitioning the selected one of the first plurality of units of audio signal data into a second plurality of units of audio signal data. Johnson discloses further partitioning a speech frame into sub-frames and processing each sub-frame (**Johnson, page 7, section 4.4, in order to take advantage of the slow rate of change of LPC coefficients without sacrificing the quality of the coded residual, most LPC-AS coders encode speech using a frame-subframe structure**). The combined teachings teach all limitations of this claim.

Robinson in view of Nadon and Johnson are analogous art because they are from a similar field of endeavor in audio (speech) coding. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Robinson's teaching with Johnson's teaching to further partition a frame of residual signal into subframes and process each subframes to take advantage of the

slow rate of change of LPC coefficients without sacrificing the quality of the coded residual (**Johnson, page 7, section 4.4**).

Regarding claim 6, which depends on claim 5, Robinson, Nadon and Johnson disclose all limitations of claim 5. Robinson further discloses repeating the further partitioning, the selecting, the performing, and the repeating of claim 5, until all of the first plurality of units of audio signal data have been transmitted in substance to the recipient (**Robinson, page 1-10, shorten program compresses a signal on a frame-by-frame base until all frames are processed, Johnson teaches partitioning each frame into subframes and processing each subframe, combined teachings teach all limitations of this claim**).

8. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson in view Nadon and further in view of Kim (US Pat. 6, 094,636).

Regarding claims 16 and 18, which depends on 14, Robinson in view of Nadon discloses all limitations of 14, Robinson discloses constructing codes using the Huffman algorithm but does not say constructing codes using the run-length or arithmetic algorithm. Kim discloses constructing codes using Huffman, run-length or arithmetic algorithm (**Kim, col. 8, lines 9-10**).

Robinson and Kim are analogous art because they are from a similar field of endeavor in audio coding. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Robinson's teaching with Kim's teaching to substitute the Hoffman coding algorithm with the run-length or arithmetic coding algorithm. All these coding algorithms are well known in variable length coding art. Simple substitution of one known element for another would obtain predictable results.

9. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson in view of Nadon and further in view of Loh (US Pat. 3,694,813, hereinafter referred to as Loh).

Regarding claim 17, which depends on 14, Robinson in view of Nadon discloses all limitations of 14, Robinson discloses constructing codes using the Huffman algorithm but does not say constructing codes using the Gilbert-Moore algorithm. Loh discloses constructing codes using the Gilbert-Moore algorithm (**Loh, col. 4, line 42**).

Robinson and Loh are analogous art because they are from a similar field of endeavor in compressing data. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Robinson's teaching with Loh's teaching to substitute the Hoffman coding algorithm with the Gilbert-Moore algorithm. All these coding algorithms are well known in variable length coding

art. Simple substitution of one known element for another would obtain predictable results.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kenyon (USPat, 5,210,820) discloses measuring skewness and kurtosis of the distribution of speech feature vectors.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JIALONG HE whose telephone number is (571)270-5359. The examiner can normally be reached on Monday-Thursday, 7:00 - 4:30, Alt Friday, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JH/

/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2626